

FORM PTO-1390
(REV. 5-79)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S REFERENCE NUMBER

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

U.S. APPLICATION NO. (known, see 37 CFR 1.15)

10/009906

INTERNATIONAL APPLICATION NO.

PCT/AU00/00655

INTERNATIONAL FILING DATE

09 June 2000

PRIORITY DATE CLAIMED

10 June 1999

TITLE OF INVENTION

ACOUSTIC TRANSMISSION USING DIGITAL MOBILE PHONES

APPLICANT(S) FOR DO/EO/US

PLATT, Harry Louis; JANKOV, Vladimir

SMALL ENTITY STATUS IS APPLICABLE

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 19(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☒ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A **FIRST** preliminary amendment.
☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.

16. ☒ Other items or information: 1. International Search Report
2. Int'l Preliminary Examination Report

"Express Mail" mailing label number EF 670106897 US

Date of Deposit December 10, 2001

I hereby certify that this paper is being deposited with the U.S. Postal Service "Express Mail-Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to: Hon. Commissioner of Patents and Trademarks, Washington, D. C. 20231.



Edwin D. Schindler, Reg. No. 31,459

December 10, 2001

Date

10/009906

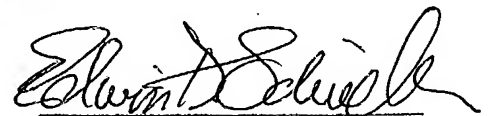
17. <input checked="" type="checkbox"/> The following fees are submitted:				CALCULATIONS		PTO USE ONLY	
Basic National Fee (37 CFR 1.492(a)(1)-(5)): Search Report has been prepared by the EPO or JPO..... \$830.00				1613 Rec'd PCT/PTO		10 DEC 2001	
International preliminary examination fee paid to USPTO (37 CFR 1.482)..... \$640.00 No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)).. \$710.00 Neither international preliminary examination fee (37 CFR 1.482) nor \$1,040.00 international search fee (37 CFR 1.445(a)(2)) paid to USPTO..... \$950.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)..... \$90.00							
ENTER APPROPRIATE BASIC FEE AMOUNT =				\$	1,040.00		
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$	-0-		
Claims	Number Filed	Number Extra	Rate				
Total 3 Claims	3 -20 =	-0-	X \$22.00	\$	-0-		
Independent Claims	1 -3 =	-0-	X \$74.00	\$	-0-		
Multiple dependent claims(s) (if applicable)				+	\$230.00	\$	-0-
TOTAL OF ABOVE CALCULATIONS				=	\$	1,040.00	
Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28). Small Entity Status				\$	-520.00		
SUBTOTAL				=	\$	520.00	
Processing fee of \$130.00 for furnishing the English translation later the <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				+	\$	-0-	
TOTAL NATIONAL FEE				=	\$	520.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				\$	-0-		
TOTAL FEES ENCLOSED				=	\$	520.00	
				Amount to be:			
				refunded		\$	
				charged		\$	

- a. ☒ A check in the amount of \$**520.00 to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. _____ in the amount of \$_____ to cover the above fees. A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 19-0450. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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 Five Hirsch Avenue
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SIGNATURE

Edwin D. Schindler

NAME

31,459

REGISTRATION NUMBER

ACOUSTIC TRANSMISSION USING DIGITAL MOBILE PHONES

The present invention relates to the field of monitoring a cardiac patient's electrical cardiac activity at a central location by means of an apparatus associated with a digital mobile phone handset and transmitting the information over the digital mobile phone/ telephone
5 network.

BACKGROUND TO THE INVENTION

Cardiac event recorders use acoustic transmission of recorded signals via telephone systems. An ECG signal is frequency modulated in the audio band of the conventional telephone line. Digital mobile telephones use special filtering techniques in order to reduce
10 the amount of transmitted data. The filtering algorithm used can recognise a non-voice sound and suppress it. Therefore, frequency modulated ECG signals are treated by the digital mobile telephone system as a single frequency unwanted noise.

It would be advantageous to provide a method of transmitting frequency modulated ECG signals via a digital mobile phone network as this would greatly enhance the ability of a
15 cardiac patient to be diagnosed remote from the health professionals.

OBJECT OF THE INVENTION

It is an object of the present invention to provide a method and apparatus when monitoring cardiac activity, to transmit frequency modulated signals over a digital mobile phone
network.

20

DISCLOSURE OF THE INVENTION

According to one aspect of the present invention there is disclosed a method of transmitting frequency modulated data signals over a digital mobile phone network which filters the transmitted data signals, said method comprising the step of providing original said frequency modulated data signals with more than one frequency.

25 Preferably the frequency modulated data signals having more than one frequency are modulated in amplitude as well.

In one form of the invention, the frequency modulated data signals having more than one frequency is achieved by generating a pseudo random sequence which does not overlap the frequency band of the FM data signals and mixing the sequence with the original data frequency modulated signals.

- 5 Preferably, the pseudo random sequence has a lower frequency band than that of the original data frequency modulated signals.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be now be described with reference to the accompanying drawing in which:

- 10 Fig. 1 is a diagram showing the relative frequency bands of the mixed signals in accordance with the preferred embodiment of the present invention; and

Fig. 2 is a schematic block diagram of the circuitry used in the preferred embodiment of the present invention.

BEST MODE OF CARRYING OUT THE INVENTION

- 15 A mixing circuit 10 is illustrated in Fig. 2. The circuit 10 includes a CPU 11 with a push-pull speaker driver 12. The CPU 11 generates frequency modulated data signals FM ECG 1 and FM ECG 2 as well as a pseudo random sequence PRS having frequency bands as illustrated in Fig. 1.

- Resistor R1 of the push-pull speaker driver 12 limits the current from the output of the CPU
20 11 while the PRS signal is also applied to the speaker via the resistor R2. The signals FM ECG 1 and PRS are mixed at the speaker which allows for the amplitude modulation of the FM ECG 1 - FM ECG 2 signal by the lower frequency PRS signal.

The foregoing describes only one embodiment of the present invention, and modifications obvious to those skilled in the art can be made thereto without departing from the scope of the present invention.

CLAIMS

1. A method of transmitting frequency modulated data signals over a digital mobile phone network which filters the transmitted data signals, said method includes the step of providing original said frequency modulated data signals with more than one frequency,
- 5 wherein, the frequency modulated data signals having more than one frequency is achieved by generating a pseudo random sequence which does not overlap the frequency band of the FM data signals and mixing the sequence with the original data frequency modulated signals.
2. The method of transmitting frequency modulated data signals according to claim 1, wherein the frequency modulated data signals having more than one frequency are also
- 10 modulated in amplitude.
3. The method of transmitting frequency modulated data signals according to claim 1, wherein the pseudo random sequence has a lower frequency band than that of the original data frequency modulated signals.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

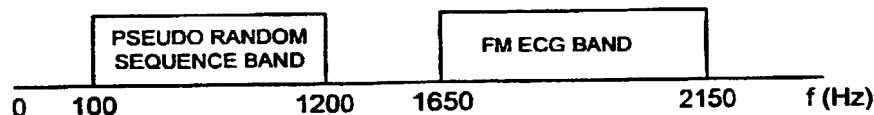
(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
21 December 2000 (21.12.2000)

PCT

(10) International Publication Number
WO 00/78065 A1

- (51) International Patent Classification⁷: H04Q 7/20, (74) Agent: YOUNG, Philip, Claude; Wilson & Young, P.O. Box 553, Alexandria, NSW 1435 (AU).
H04L 27/10
- (21) International Application Number: PCT/AU00/00655 (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
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- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:**
— With international search report.
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: ACOUSTIC TRANSMISSION USING DIGITAL MOBILE PHONES



(57) Abstract: A method of transmitting frequency modulated data signals over a digital mobile phone network which filters the transmitted data signals is disclosed. The method includes the step of providing original said frequency modulated data signals with more than one frequency, whereby the frequency modulated data signals having more than one frequency are preferably also modulated in amplitude. In one form, the frequency modulated data signals having more than one frequency is achieved by generating a pseudo random sequence which does not overlap the frequency band of the FM data signals and mixing the sequence with the original data frequency modulated signals, whereby the pseudo random sequence has a lower frequency band than that of the original data frequency modulated signals.

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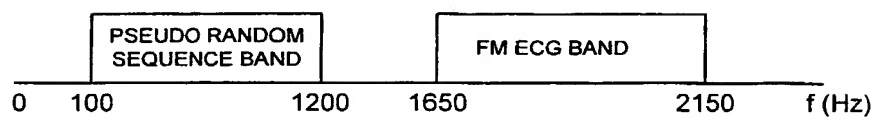


Fig 1

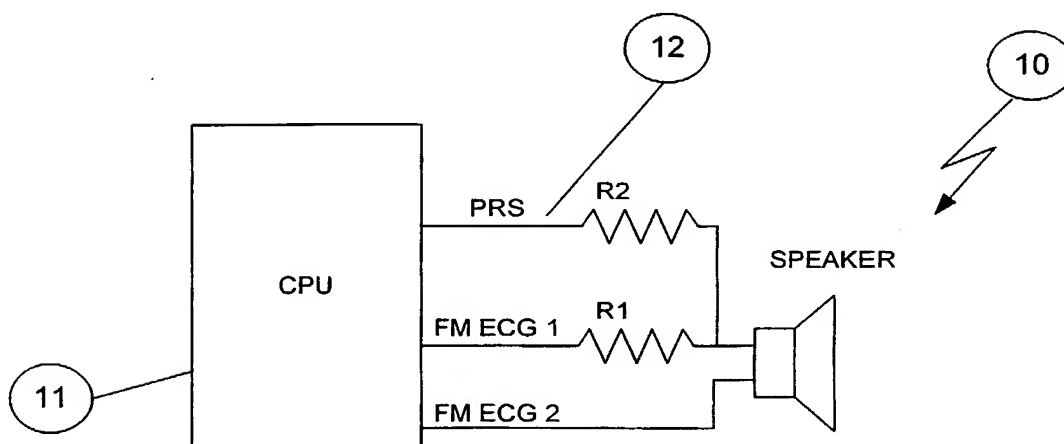


Fig 2

Declaration and Power of Attorney For Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Acoustic transmission using digital mobile phones

the specification of which

(check one)

☐ is attached hereto.

☒ was filed on 9 June 2000 as

Application Serial No. PCT/AU00/00655 (assigned U.S.S.N. 10/009,906)

and was amended on _____
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed	
PQ0884	Australia	10 June 1999	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
(Number)	(Country)	(Day/Month/Year Filed)	<input type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
(Number)	(Country)	(Day/Month/Year Filed)	<input type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT International filing date of this application:

10009906.091902

Page

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

EDWIN D. SCHINDLER, Registration No. 31,459

Edwin D. Schindler

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Inventor's signature	<u>[Signature]</u>
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Citizenship	<u>Australian</u>
Post Office Address	<u>14/166 Belmore Road, Randwick, NSW, 2031, Australia</u>
Full name of second joint inventor, if any	<u>Vladimir Jankov</u>
Second inventor's signature	<u>[Signature]</u>
Residence	<u>14/166 Belmore Road, Randwick, NSW, 2031, Australia</u>
Citizenship	<u>Australian</u>
Post Office Address	<u>14/166 Belmore Road, Randwick, NSW, 2031, Australia</u>

(Supply similar information and signature for third and subsequent joint inventors.)